

Notice of Allowability

Application No.

10/808,807

Examiner

Kagnew H. Gebreyesus

Applicant(s)

CHENG ET AL.

Art Unit

1652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to March 24, 2005.
2. ☒ The allowed claim(s) is/are 1,3,6,7,17,19-21 and 24-26.
3. ☒ The drawings filed on 3/24/04 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date <u>6/14/04</u> | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

DETAILED ACTION

1. During a telephone conversation with Attorney Neil Feltham on on March 24, 2005 a provisional election was made with traverse to prosecute the invention of Group VII, claims 1, 6, 7, 17, 19, 21, 24, 20, 25, 26 in part, and claim 3. Affirmation of this election must be made by applicant in replying to this Office action. Claims 2, 4, 5, 8-16, 18, 22, 23 and 27-36 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Amendment to the specification:

Amendment to the specification was entered as follows: On line 28-29 replace “(Nelis and Leenheer, Appl Bacteriol. 70:181-191 (1991))” with --(Nelis and Leenheer, **Journal of Appl Bacteriol.** 70:181-191 (1991)--.

EXAMINER’S AMENDMENT

1. An examiner’s amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner’s amendment was given in a telephone interview with Dr. S. Neil Feltham on March 24, 2005.

The application has been amended as follows:

Amendment to the claims:

Claim 1: “An isolated nucleic acid molecule of SEQ ID NO: 18, encoding carotenoid biosynthetic pathway enzymes, comprising a polynucleotide wherein the genetic organization of the polynucleotides is: *crtE-idi-crtY-crtl-crtB-crtZ*, wherein the *crtE-idi-crtY-crtl-crtB-crtZ* genes are clustered in the order stated and wherein the transcription of the *crtZ* occurs in opposite orientation to that of *crtE-idi-crtY-crtl-crtB*.”

Claim 3: The isolated nucleic acid molecule of claim 1 consisting of the sequence as set forth in SEQ ID NO: 18.

Claim 6: “An isolated nucleic acid molecule as set forth in SEQ ID NO: 18, wherein said nucleic acid molecule encodes *crtE*, *idi*, *crtY*, *crtl*, *crtB* and *crtZ* or an isolated nucleic acid molecule having at least 95% identity to SEQ ID NO: 18, wherein said isolated nucleic acid molecule encodes the following enzymes: Geranylgeranyl pyrophosphate synthase (*crtE*), isopentenyl pyrophosphate (*idi*), lycopene cyclase (*crtY*), phytoene desaturase (*crtl*), phytoene synthase (*crtB*) and beta-carotene hydroxylase (*crtZ*)”.

Claim 7: The isolated nucleic acid molecule of claim 1 isolated from *Pantoea agglomerans* strain DC404.

Claim 20: Delete the term “claim 18”.

Claim 21: Delete the term “claim 18”.

Claim 25: Replace the term “any one of claims 22-24” and with -- claim 24—

Cancel claims 2, 4, 5, 8-16, 18, 22, 23 and 27-36.

Allowable subject matter:

Claims 1, 3, 6, 7, 17, 19, 20, 21, 24, 25, 26 are allowed with the proper amendments as above.

The following is an examiner's statement of reasons for allowance:

All claims are limited to an isolated nucleic acid molecule of SEQ ID NO: 18, comprising *crtE*, *idi*, *crtY*, *crtl*, *crtB* and *crtZ* or a nucleic acid molecule having 95% sequence identity to SEQ ID NO: 18 wherein the isolated polynucleotide molecule encodes all of the polypeptides *crtE*, *idi*, *crtY*, *crtl*, *crtB* and *crtZ* and method of expression/production of said polypeptides. The closest prior art having sequence and functional identity to the applicant's invention is by Kamiunten et. al., Rouviere et. al. (US 20040209365A1) and Cheng et. al. (US20040219629A1).

Kamiunten et al. (Isolation and characterization of carotenoids biosynthetic genes from *Pantoea agglomerans*) disclose a sequence from *Pantoea agglomerans* with sequence accession number AB076662 which shows 61.5% best local similarity and only 24.6% identity to SEQ ID NO: 18 of the present invention.

Rouviere et. al. (US 20040209365A1, "Parallel chromosomal stacking of traits in bacteria") or Cheng et. al. (US 20040219629A1, "Increasing carotenoids production in bacteria via chromosomal integration) both show a sequence with 60.1% best local similarity and only 23% identity to SEQ ID NO:18.

Therefore none of the references, nor the prior art in general, teach or suggest the specific nucleic acid molecule of SEQ ID NO: 18, comprising *crtE*, *idi*, *crtY*, *crtl*, *crtB* and *crtZ* or a nucleic acid molecule having 95% sequence identity to SEQ ID NO: 18.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kagnew H Gebreyesus whose telephone number is 571-272-2937. The examiner can normally be reached on 8:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Achutamurthy ponnathapura can be reached on 571-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kagnew Gebreyesus PhD.
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